

ASU Browser (16/21) S and console (US 6249132 B1) for S1Doc //211 format: KWIC

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Detailed Description Text - DETX (7):

The probe apparatus of this embodiment has a heated gas spray unit 11 as a heating means for heating the object. The heated gas spray unit 11 sprays a heated gas (e.g., air) to the wafer W which is passing through the loading/unloading port 9A when the opening/closing door 10 is opened. The heated gas spray unit 11 comprises a heated gas injection mechanism 12 incorporated in the opening/closing door (to be referred to as the "door" hereinafter) 10, a gas heating mechanism 14 connected to the heated gas injection mechanism 12 through a pipe 13A, and a solenoid valve 15 connected to the gas heating mechanism 14 through a pipe 13B. As the gas heating mechanism 14, a heating means such as an electric heater or a ~~temperature~~ can be employed. The ~~temperature~~ is a known mechanism which can generate a high-temperature gas of about 80.degree. C. and a low-temperature gas of about -30.degree. C. from a high-pressure gas (air) of, e.g., about 30.degree. C.

The solenoid valve 15 is opened in synchronism with the opening operation of the door 10 to supply a gas at a predetermined pressure to the gas heating mechanism 14.

Claims Text - CLTX (2):

the inspection step of inspecting predetermined characteristics of a ~~semiconductor~~ wafer, the inspection step including at least inspection in a first environment which is at a first temperature; and

Claims Text - CLTX (3):

the unloading step of unloading said a ~~semiconductor~~ wafer which has undergone the inspection step, the unloading step including heating said ~~semiconductor~~ wafer to a temperature at which moisture condensation does not occur on a surface of said ~~semiconductor~~ wafer during transfer of said object from said first environment to a second environment which is at a second temperature greater than said first temperatures wherein said step of heating said ~~semiconductor~~ wafer includes spraying a heated gas of a predetermined temperature to said ~~semiconductor~~ wafer subjected to the inspection step at a loading/unloading port of an inspection chamber.

Claims Text - CLTX (4):

2. A method according to claim 1, wherein the step of spraying a heated

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United States Patent

Amemiya

(12) Patent No.: US 6,249,132 B1

(45) Date of Patent: Jun. 19, 2001

(54) INSPECTION METHODS AND APPARATUSES

(75) Inventor: Hiroshi Amemiya, Yamaguchi-ken (JP)

(73) Assignee: Tokyo Electron Limited, Tokyo (JP)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/018,941

(22) Filed: Feb. 8, 1998

(30) Foreign Application Priority Data

Feb. 12, 1997 (JP) 3-042851

(51) Int. Cl.<sup>7</sup> G01R 31/02; G01R 1/04

(52) U.S. Cl. 324/760; 324/754; 324/58.1

(53) Field of Search 324/754, 760, 324/755, 159.1

Reference Cited

U.S. PATENT DOCUMENTS

3,967,361 \* 10/1976 Mada, Jr. et al. 324/215

4,184,332 \* 5/1979 Monchling et al. 324/780

4,782,201 \* 12/1988 Rando 324/760

4,787,732 \* 12/1988 Paer et al. 324/760

4,922,909 \* 11/1990 Quaresima 324/760

5,097,207 \* 5/1992 Baez 324/760

5,313,134 \* 5/1994 Kiy et al. 324/760

5,397,991 \* 3/1995 Ohtsuka 324/215

5,414,370 \* 5/1995 Hoshino et al. 324/760

5,457,395 \* 10/1995 Skowronski et al. 324/754

5,662,554 \* 12/1997 Huber 324/760

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5,756,950 \* 6/1998 Saw et al. 11A/708

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63-207938 6/1988 (JP)

6-323714 11/1994 (JP)

7-111995 11/1995 (JP)

cited by examiner

Primary Examiner—Sefi Metzbach

Assistant Examiner—Jennelle M. Hollington

(74) Attorney, Agent, or Firm—Obion, Seivak, McClelland, Maier & Newman, P.C.

(57) ABSTRACT

In the embodiment of this invention, a probe apparatus includes a loader chamber having lock for conveying the wafer, a probe chamber arranged next to the loader chamber and having a main chuck movable to the X, Y, Z, and  $\theta$  directions, a partition for separating the probe chamber from the loader chamber, and a door for opening/closing the loading/unloading port of the wafer, which is formed in the partition. This probe apparatus inspects the electrical characteristics of the wafer while supplying dry air at a temperature at which moisture condensation does not occur into the probe chamber to cool the wafer through the main chuck. A heated gas spray unit sprays a heated gas onto the wafer which is moving from the probe chamber to the loader chamber through a loading/unloading port, thereby heating the wafer to a temperature higher than room temperature.

14 Claims, 4 Drawing Sheets

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14 Claims, 4 Drawing Sheets

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